21.—Student Training at the Rottnest Biological Station

At the present time the Station is used only by the Zoology Department for regular student training although staff and students of other University departments use it from time to time. Training is at three levels: postgraduate, during the third year of the degree course, and at the beginning of the second year.

Postgraduate

Participation in research projects discussed in other parts of this report has formed a large part of the training of Honours, M.Sc. and Ph.D. Candidates. The Station has been the base for their field operations with the island fauna their main research material. No separate account of this aspect of student training is required here.

Population Ecology

At the end of their third year course students spend a week at the Station making a practical study of the dynamics of animal populations. This is regarded as an integral part of the Zoology course and a short written examination has been included during the last two years. The fact that staff and students live and work together the whole time effectively counteracts any tendency to take the course light-heartedly after the major examination tension has ended. There are opportunities both for fun and relaxation and for stimulating discussion as a result of common interest in the problems studied. For staff this is often also an opportunity to evaluate the results of the year's teaching, sometimes with outspoken criticism from students, and to plan future teaching and research programmes.

The ordinary laboratory course necessarily presents the student with the animals he is studying as individuals. Whether it be in the study of systematics, comparative anatomy, or physiology, the animal is usually treated as a unit, representative perhaps of a family, class, or phylum, but rarely as one of a population of similar individuals. In this field course emphasis is laid throughout on a study of quantitative attributes of populations of animals: reproductive rates, mortality rates, immigration and emigration rates, age structure, and total numbers in the populations.

The methods used are those which have yielded research results in population studies. The same species of animal, and in many cases the same populations, have been studied in successive years and the results obtained form part of research programmes discussed elsewhere in this report.

The statistical knowledge necessary to the working of the various estimates is acquired through a series of lectures in biological statistical methods given during the third-year course.

The principal animals studied are:

1.—Jewel beetles, *Castiarina hopei*, on flowers of the "Rottnest daisy." Random samples are captured on discrete daisy patches, marked, released, and recaptured over successive days, with the object of determining adult life span, adult recruitment rates, and population total numbers.

2.—The black periwinkle, *Melanerita melanotragus*, on intertidal rocks. This has proved ideal for student exercises in estimation of population size because estimates made by the mark and return method can be immediately checked by a total physical count.

3.—The whelk, *Dicathais aegrota*, on intertidal rock platforms. Samples attracted to baited traps are marked, returned, and recaptured. "Latin square" evaluation of captures makes it possible to study food preferences and distribution on the platforms.

4.—The rock crab, *Leptograpsus variegatus*, is caught by hand at night on intertidal rocks for estimation of total population and habitat preference of the three colour phases. The size of the population is determined by the method of removal of one sex and a subsequent count to reveal a change in sex ratio from which a population size estimate is made.

5.—The quokka: estimation of population size by ear tagging and return, and a measure of relative abundance by visual counts on a regular circuit.

Second-year Camp

This is held over four days immediately before the start of first term and all students entering the second year course in Zoology are required to attend. The camp has two main aims: first to enable staff and students to get to know one another in the friendly atmosphere of a camp, and second to introduce students to living representatives of the various phyla.

The marine environment is the richest source of material and receives most attention, but collections are also made in the salt lakes to show the restricted fauna of a specialised environment, and students assist in aspects of the quokka research programme. Animals collected are brought back to the laboratory and are identified as far as possible with standard texts, by means of simple keys, and sometimes by reference to original literature. In most cases no attempt is made to run them down to species, the emphasis being rather on learning to recognise the broad systematic position of the animals and to know *how* to identify them.

The second year course has an ecological background, but animals handled in the systematics course are of necessity often preserved. The emphasis in this introductory camp is on seeing as many kinds of animal as possible alive in their natural environments. Attention is constantly drawn to the relationship of the animals to their physical environment and to one another.

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